

IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) An electrophoretic display ~~(1)~~ with a pixel ~~(10)~~ comprising:
 - a reservoir volume ~~(RV)~~ and an image volume ~~(PV)~~,
 - ~~different types of particles (Pa, Pb, Pc)~~ having different colors and different electrophoretic mobilities, wherein the particles ~~(Pa, Pb, Pc)~~ determine a visible color of the pixel ~~(10)~~ when present in the image volume ~~(IV)~~, and wherein the particles ~~(Pa, Pb, Pc)~~ do not contribute to the visible color of the pixel ~~(10)~~ when present in the reservoir volume ~~(RV)~~,
 - select electrodes ~~(SE1, SE2)~~ for generating in the reservoir volume ~~(RV)~~ a select electric field ~~(SF)~~ for separating the ~~different types of particles (Pa, Pb, Pc)~~ in different sub-volumes ~~(SVa, SVb, SVc)~~ in the reservoir volume ~~(RV)~~, and
 - at least one fill electrode ~~(FE1, FE2)~~ for generating a fill electric field (FF) to move the ~~different types of particles (Pa, Pb, Pc)~~ from the sub-volumes ~~(SVa, SVb, SVc)~~ into the image volume, ~~(IV)~~ wherein an outer perimeter of the pixel is non-uniform.

2. (Currently Amended) ~~An The~~ electrophoretic display (1) as claimed in claim 1, wherein the at least one fill electrode (~~FE1, FE2~~) is positioned to obtain the fill electric field (~~FF~~) directed for simultaneously moving the ~~different types of~~ particles (~~Pa, Pb, Pc~~) from the sub-volumes (~~SVa, SVb, SVc~~) into the image volume (~~IV~~).

3. (Currently Amended) ~~An The~~ electrophoretic display (1) as claimed in claim 1, wherein the fill electrodes (~~FE2~~) comprise sub fill electrodes (~~FE2a, FE2b, FE2c~~) associated with the different sub-volumes (~~SVa, SVb, SVc~~) for generating the fill electric field (~~FF~~) to comprise sub fill electric fields (~~FFa, FFb, FFc~~) in the different sub-volumes (~~SVa, SVb, SVc~~).

4. (Currently Amended) ~~An The~~ electrophoretic display (1) as claimed in claim 3, wherein the select electric field (~~SF~~) extends in a first direction (~~y~~) and the sub fill electric fields (~~FFa, FFb, FFc~~) in a second direction (~~x~~) different from the first direction.

5. (Currently Amended) ~~An The~~ electrophoretic display (1) as claimed in claim 4, wherein the reservoir volume comprises shielding electrodes (~~FE1a, FE1b~~) for substantially shielding in the first direction (~~y~~) the sub fill electric fields (~~FFa, FFb, FFc~~) of the different sub-volumes (~~SV1, SV2, SV3~~) from each other.

6. (Currently Amended) ~~An The~~ electrophoretic display ~~(1)~~ as claimed in claim 4, wherein the pixel ~~(10)~~ comprises a further fill electrode ~~(CF)~~ arranged in the image volume ~~(IV)~~ in the second direction further away from the reservoir volume ~~(RV)~~ than the sub fill electrodes ~~(FE2a, FE2b, FE2c)~~ for attracting the particles ~~(Pa, Pb, Pc)~~ leaving the sub-volumes ~~(SVa, SVb, SVc)~~ further into the image volume ~~(IV)~~.

7. (Currently Amended) ~~An The~~ electrophoretic display ~~(1)~~ as claimed in claim 6, wherein the further fill electrode ~~(CF)~~ is positioned in the second direction ~~(x)~~ at a border of the image volume ~~(IV)~~ at a maximal distance from the reservoir volume ~~(RV)~~.

8. (Currently Amended) ~~An~~ electrophoretic display ~~(1)~~ ~~as claimed in claim 6~~ comprising a pixel comprising,
a reservoir volume and an image volume,
particles having different colors and different
electrophoretic mobilities, wherein the particles determine a
visible color of the pixel when present in the image volume, and
wherein the particles do not contribute to the visible color of the
pixel when present in the reservoir volume,
select electrodes for generating in the reservoir volume a
select electric field for separating the particles in different
sub-volumes in the reservoir volume, and
at least one fill electrode for generating a fill electric
field to move the particles from the sub-volumes into the image
volume,

wherein the fill electrodes comprise sub fill electrodes associated with the different sub-volumes for generating the fill electric field to comprise sub fill electric fields in the different sub-volumes,

wherein the select electric field extends in a first direction and the sub fill electric fields in a second direction different from the first direction,

wherein the pixel comprises a further fill electrode, and wherein the further fill electrode (CF) is positioned in the second direction (x) within the image volume (IV) but at less than the maximal distance from the reservoir volume (RV).

9. (Currently Amended) ~~An~~ The electrophoretic display (1) as claimed in claim 6, wherein the further fill electrode (CF) is positioned with respect to the sub-volumes (SVa, SVb, SVc) to obtain a fill electric field which is higher for the particles (Pa) having a slower electrophoretic mobility than for the particles having a higher electrophoretic mobility.

10. (Currently Amended) ~~An~~ The electrophoretic display (1) as claimed in claim 1, further comprising:

a further reservoir volume ~~(FRV)~~,

further select electrodes ~~(SEV1, SEV2)~~ for generating in the further reservoir volume ~~(FRV)~~ a further select electric field ~~(SEV)~~ for separating the different types of particles (Pa, Pb, Pc) in further different sub-volumes ~~(FSVa, FSVb, FSVc)~~ in the further reservoir volume ~~(FRV)~~, and

further fill electrodes ~~(FFE2a, FFE2b, FFE2c)~~ for generating a further fill electric field ~~(FFFa, FFFb, FFFc)~~ to simultaneously or time sequentially move the different types of particles ~~(Pa, Pb, Pc)~~ from the further sub-volumes ~~(FSVa, FSVb, FSVc)~~ into the image volume ~~(IV)~~.

11. (Currently Amended) ~~An~~ The electrophoretic display as claimed in claim 10, wherein the electrophoretic display ~~(1)~~ comprises a controller for controlling the ~~first mentioned~~ select electrodes ~~(SE1, SE2)~~, the at least one ~~first mentioned~~ fill electrode ~~(FE1, FE2)~~, the further select electrodes ~~(SEV1, SEV2)~~, and the further fill electrodes ~~(FFE2a, FFE2b, FFE2c)~~ to obtain a separation of the ~~different types of particles (Pa, Pb, Pc)~~ in the ~~first mentioned~~ reservoir volume ~~(RV)~~ simultaneously to filling or resetting particles ~~(Pa, Pb, Pc)~~ to or from the further reservoir volume ~~(FRV)~~, or the other way around.

12. (Currently Amended) ~~An~~ The electrophoretic display as claimed in claim 1, wherein the image volume ~~(IV)~~ is box shaped, the select electrodes ~~(SE1, SE2)~~ being arranged for generating the select electric field ~~(SF)~~ in a first direction ~~(y)~~ substantially parallel with a border plane of the image volume ~~(IV)~~, and the fill electrodes ~~(FE1, FE2)~~ being arranged for generating the fill electric field ~~(FF)~~ in a second direction ~~(x)~~ substantially perpendicular to the first direction ~~(y)~~.

13. (Currently Amended) ~~An~~ The electrophoretic display as claimed in claim 1, further comprising reset means ~~(SE1)~~ for removing the particles ~~(Pa, Pb, Pc)~~ from the image volume ~~(IV)~~ to store the particles ~~(Pa, Pb, Pc)~~ in a store volume ~~(SV)~~ in the reservoir volume ~~(RV)~~.

14. (Currently Amended) ~~An~~ The electrophoretic display as claimed in claim 13, wherein the reset means ~~(SE1)~~ comprise one of the select electrodes ~~(SE1)~~ for attracting the particles ~~(Pa, Pb, Pc)~~ in the image volume ~~(IV)~~ towards the store volume ~~(RV)~~ adjacent to the one of the select electrodes ~~(SE1)~~.

15. (Currently Amended) ~~An~~ The electrophoretic display as claimed in claim 1, wherein the mobility of the ~~different types of~~ particles ~~(Pa, Pb, Pc)~~ has a predetermined ratio, and wherein a movement path of the particles ~~(Pa, Pb, Pc)~~ in the reservoir volume has a length to enable the particles ~~(Pa, Pb, Pc)~~ to be separated in the sub-volumes ~~(SVa, SVb, SVc)~~ which are substantially non-overlapping.

16. (Currently Amended) ~~An~~ The electrophoretic display as claimed in claim 15, wherein the ~~different types of~~ particles ~~(Pa, Pb, Pc)~~ comprise a first, second and third type of particles all being charged in the same polarity, and having different mobilities.

17. (Currently Amended) ~~An~~ The electrophoretic display as claimed in claim 15, wherein the ~~different types of~~ particles ~~(Pa, Pb, Pc)~~

comprise a first and a second type of particles both being charged in the same polarity and having different mobilities and a third type of particles being charged oppositely.

18. (Currently Amended) ~~An~~ The electrophoretic display as claimed in claim 1, wherein the pixel comprises a reset electrode ~~(RE)~~ to attract the particles ~~(Pa, Pb, Pc)~~ during a reset phase wherein the particles ~~(Pa, Pb, Pc)~~ have to be moved into a store volume ~~(SV)~~ in the reservoir volume ~~(RV)~~.

19. (Currently Amended) ~~An~~ The electrophoretic display as claimed in claim 18, wherein the reset electrode ~~(RE)~~ is associated with the center of the image volume ~~(IV)~~, and wherein the electrophoretic display further comprises a processor ~~(3)~~ for successively supplying a voltage to the reset electrode to attract the particles ~~(Pa, Pb, Pc)~~ towards the center of the image volume ~~(IV)~~ and a voltage to one of the select electrodes ~~(SE1)~~ being associated with the store volume ~~(SV)~~ to attract the particles ~~(Pa, Pb, Pc)~~ to move into the store volume ~~(SV)~~.

20. (Currently Amended) A method of driving an electrophoretic display ~~(1)~~ with a pixel ~~(10)~~, the electrophoretic display comprising:

a reservoir volume ~~(RV)~~ and a image volume ~~(IV)~~,
~~different types of particles (Pa, Pb, Pc) having different~~
colors and different electrophoretic ~~mobility'~~ smobilities, wherein
the particles ~~(Pa, Pb, Pc)~~ determine a visible color of the pixel

~~(10)~~ when present in the image volume ~~(IV)~~, and wherein the particles ~~(Pa, Pb, Pc)~~ do not contribute to the visible color of the pixel ~~(10)~~ when present in the reservoir volume ~~(RV)~~, the method comprising:

generating ~~(SE1, SE2)~~ in the reservoir volume ~~(RV)~~ a select electric field ~~(SF)~~ for separating the ~~different types of~~ particles ~~(Pa, Pb, Pc)~~ in different sub-volumes ~~(SVa, SVb, SVc)~~ in the reservoir volume ~~(RV)~~, and

generating ~~(FE1, FE2)~~ a fill electric field ~~(FF)~~ to move the ~~different types of~~ particles ~~(Pa, Pb, Pc)~~ from the sub-volumes ~~(SVa, SVb, SVc)~~ into the image volume, (IV) wherein an outer perimeter of the pixel is non-uniform.

21. (Currently amended) A display apparatus comprising an electrophoretic display as claimed in claim 1, wherein a portion of the perimeter bulges outward.